EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	53180	polyhydroxyalkanoate$ or polyhydroxy alkanoate$ or pha$1	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 12:31
L2	18512	xylose or xylan	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 12:31
L3	49	1 same 2	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 12:48
L4	1842	levulinic acid	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 12:48
L5	9	1 same 4	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:48
L6	687	1 and 2	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:04
L7	52	6 and hemicellulos$	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:04
L8	59	1 and 4	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:48
L9	3994	2 same carbon	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:49
L10	123	1 and 9	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:49
L11	120	1 and hemicellulos$	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:49
L12	7	10 and 11	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:51
L13	12	8 and (2 or hemicellulos$)	US-PGPUB; USPAT	ADJ	OFF	2007/08/09 13:51

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* * * * * * * * * * * * * * STN  Columbus  * * * * * * * * * * * * * * *

FILE 'HOME' ENTERED AT 14:50:30 ON 09 AUG 2007

=> fil .bec
COST IN U.S. DOLLARS                                     SINCE FILE      TOTAL
                                                              ENTRY    SESSION
FULL ESTIMATED COST                                            0.21       0.21

FILES 'MEDLINE, SCISEARCH, LIFESCI, BIOTECHDS, BIOSIS, EMBASE, HCAPLUS, NTIS,
       ESBIOBASE, BIOTECHNO, WPIDS' ENTERED AT 14:50:55 ON 09 AUG 2007
ALL COPYRIGHTS AND RESTRICTIONS APPLY.  SEE HELP USAGETERMS FOR DETAILS.

11 FILES IN THE FILE LIST

=> s polyhydroxyalkano? or polyhydroxy alkano? or pha#
FILE 'MEDLINE'
           603 POLYHYDROXYALKANO?
           211 POLYHYDROXY
          1149 ALKANO?
             8 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
         16113 PHA#
L1       16255 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'SCISEARCH'
          1412 POLYHYDROXYALKANO?
           686 POLYHYDROXY
          5770 ALKANO?
            21 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
         10319 PHA#
L2       10902 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'LIFESCI'
           526 POLYHYDROXYALKANO?
            75 "POLYHYDROXY"
           422 ALKANO?
             9 POLYHYDROXY ALKANO?
                 ("POLYHYDROXY"(W)ALKANO?)
          6233 PHA#
L3        6359 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'BIOTECHDS'
           847 POLYHYDROXYALKANO?
           156 POLYHYDROXY
           699 ALKANO?
            40 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
           950 PHA#
L4        1357 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'BIOSIS'
           965 POLYHYDROXYALKANO?
           459 POLYHYDROXY
          2533 ALKANO?
            20 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
         17505 PHA#
L5       17826 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'EMBASE'
           813 POLYHYDROXYALKANO?
           256 "POLYHYDROXY"
          3596 ALKANO?
```

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             13 POLYHYDROXY ALKANO?
                  ("POLYHYDROXY"(W)ALKANO?)
          15673 PHA#
L6        15901 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'HCAPLUS'
           2274 POLYHYDROXYALKANO?
           7166 POLYHYDROXY
          37971 ALKANO?
             60 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
          15340 PHA#
L7        16231 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'NTIS'
              3 POLYHYDROXYALKANO?
             54 POLYHYDROXY
            182 ALKANO?
              0 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
            515 PHA#
L8          516 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'ESBIOBASE'
            680 POLYHYDROXYALKANO?
            118 POLYHYDROXY
            678 ALKANO?
             19 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
           4312 PHA#
L9         4473 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'BIOTECHNO'
            527 POLYHYDROXYALKANO?
             45 POLYHYDROXY
            528 ALKANO?
              7 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
           4715 PHA#
L10        4869 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'WPIDS'
            546 POLYHYDROXYALKANO?
           6763 POLYHYDROXY
          48735 ALKANO?
            197 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
           1376 PHA#
L11        1836 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

TOTAL FOR ALL FILES
L12       96525 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

=> s xylose or xylan or hemicellulos?
FILE 'MEDLINE'
           7299 XYLOSE
           1733 XYLAN
           1216 HEMICELLULOS?
L13        9536 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'SCISEARCH'
           7428 XYLOSE
           2794 XYLAN
           4300 HEMICELLULOS?
L14       12806 XYLOSE OR XYLAN OR HEMICELLULOS?
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FILE 'LIFESCI'
           3160 XYLOSE
           2177 XYLAN
           1006 HEMICELLULOS?
L15        5493 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'BIOTECHDS'
           3367 XYLOSE
           1740 XYLAN
           1264 HEMICELLULOS?
L16        5288 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'BIOSIS'
          12330 XYLOSE
           3378 XYLAN
           5691 HEMICELLULOS?
L17       19357 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'EMBASE'
           5765 XYLOSE
           2765 XYLAN
           1227 HEMICELLULOS?
L18        8791 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'HCAPLUS'
          27854 XYLOSE
           7137 XYLAN
          14449 HEMICELLULOS?
L19       43921 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'NTIS'
            195 XYLOSE
             57 XYLAN
            204 HEMICELLULOS?
L20         378 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'ESBIOBASE'
           2895 XYLOSE
           1311 XYLAN
           1353 HEMICELLULOS?
L21        4822 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'BIOTECHNO'
           2507 XYLOSE
           1961 XYLAN
            849 HEMICELLULOS?
L22        4604 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'WPIDS'
           3185 XYLOSE
            706 XYLAN
           1735 HEMICELLULOS?
L23        5274 XYLOSE OR XYLAN OR HEMICELLULOS?

TOTAL FOR ALL FILES
L24      120270 XYLOSE OR XYLAN OR HEMICELLULOS?

=> s l12 and l24
FILE 'MEDLINE'
L25          10 L1 AND L13

FILE 'SCISEARCH'
L26          17 L2 AND L14
```

```
FILE 'LIFESCI'
L27            6 L3 AND L15

FILE 'BIOTECHDS'
L28           14 L4 AND L16

FILE 'BIOSIS'
L29           18 L5 AND L17

FILE 'EMBASE'
L30           13 L6 AND L18

FILE 'HCAPLUS'
L31           41 L7 AND L19

FILE 'NTIS'
L32            1 L8 AND L20

FILE 'ESBIOBASE'
L33            6 L9 AND L21

FILE 'BIOTECHNO'
L34            7 L10 AND L22

FILE 'WPIDS'
L35           23 L11 AND L23

TOTAL FOR ALL FILES
L36          156 L12 AND L24

=> s levulinic acid
FILE 'MEDLINE'
          1517 LEVULINIC
       1491792 ACID
L37        357 LEVULINIC ACID
                 (LEVULINIC(W)ACID)

FILE 'SCISEARCH'
           367 LEVULINIC
       1215126 ACID
L38        334 LEVULINIC ACID
                 (LEVULINIC(W)ACID)

FILE 'LIFESCI'
            87 "LEVULINIC"
        327402 "ACID"
L39         84 LEVULINIC ACID
                 ("LEVULINIC"(W)"ACID")

FILE 'BIOTECHDS'
            86 LEVULINIC
        150607 ACID
L40         83 LEVULINIC ACID
                 (LEVULINIC(W)ACID)

FILE 'BIOSIS'
          2448 LEVULINIC
       1487284 ACID
L41       2411 LEVULINIC ACID
                 (LEVULINIC(W)ACID)

FILE 'EMBASE'
           379 "LEVULINIC"
       1497952 "ACID"
L42        372 LEVULINIC ACID
```

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                    ("LEVULINIC"(W)"ACID")

FILE 'HCAPLUS'
           4153 LEVULINIC
        4414640 ACID
L43        3895 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'NTIS'
             17 LEVULINIC
          44660 ACID
L44          15 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'ESBIOBASE'
             96 LEVULINIC
         381647 ACID
L45          89 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'BIOTECHNO'
             85 LEVULINIC
         349810 ACID
L46          85 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'WPIDS'
            497 LEVULINIC
        1104498 ACID
L47         465 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

TOTAL FOR ALL FILES
L48        8190 LEVULINIC ACID

=> s l12 and l48
FILE 'MEDLINE'
L49           5 L1 AND L37

FILE 'SCISEARCH'
L50          11 L2 AND L38

FILE 'LIFESCI'
L51           4 L3 AND L39

FILE 'BIOTECHDS'
L52           7 L4 AND L40

FILE 'BIOSIS'
L53           7 L5 AND L41

FILE 'EMBASE'
L54           4 L6 AND L42

FILE 'HCAPLUS'
L55          22 L7 AND L43

FILE 'NTIS'
L56           0 L8 AND L44

FILE 'ESBIOBASE'
L57           6 L9 AND L45

FILE 'BIOTECHNO'
L58           4 L10 AND L46
```

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FILE 'WPIDS'
L59            3 L11 AND L47

TOTAL FOR ALL FILES
L60           73 L12 AND L48

=> s (l36 or l60) not 2004-2007/py
FILE 'MEDLINE'
       2302785 2004-2007/PY
                 (20040000-20079999/PY)
L61           10 (L25 OR L49) NOT 2004-2007/PY

FILE 'SCISEARCH'
       4159178 2004-2007/PY
                 (20040000-20079999/PY)
L62           16 (L26 OR L50) NOT 2004-2007/PY

FILE 'LIFESCI'
        447645 2004-2007/PY
L63            7 (L27 OR L51) NOT 2004-2007/PY

FILE 'BIOTECHDS'
         94888 2004-2007/PY
L64           14 (L28 OR L52) NOT 2004-2007/PY

FILE 'BIOSIS'
       1955363 2004-2007/PY
L65           17 (L29 OR L53) NOT 2004-2007/PY

FILE 'EMBASE'
       2014551 2004-2007/PY
L66           12 (L30 OR L54) NOT 2004-2007/PY

FILE 'HCAPLUS'
       4548665 2004-2007/PY
L67           35 (L31 OR L55) NOT 2004-2007/PY

FILE 'NTIS'
         53793 2004-2007/PY
L68            1 (L32 OR L56) NOT 2004-2007/PY

FILE 'ESBIOBASE'
       1181490 2004-2007/PY
L69            7 (L33 OR L57) NOT 2004-2007/PY

FILE 'BIOTECHNO'
           586 2004-2007/PY
L70           11 (L34 OR L58) NOT 2004-2007/PY

FILE 'WPIDS'
       3915043 2004-2007/PY
L71            4 (L35 OR L59) NOT 2004-2007/PY

TOTAL FOR ALL FILES
L72          134 (L36 OR L60) NOT 2004-2007/PY

=> dup rem l72
PROCESSING COMPLETED FOR L72
L73             65 DUP REM L72 (69 DUPLICATES REMOVED)

=> d tot

L73    ANSWER 1 OF 65  BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN
TI     Novel fungal microorganism transformed with DNA sequence encoding
```

NADP-linked glyceraldehyde 3-phosphate dehydrogenase, useful for producing industrial products such as ethanol or polyhydroxybutyrate;
vector-mediated gene transfer and expression in fungus host cell for strain improvement and ethanol or polyhydroxybutyrate preparation
AU RICHARD P; VERHO R; LONDESBOROUGH J; PENTTILAE M
AN 2003-21166 BIOTECHDS
PI WO 2003038067 8 May 2003

L73 ANSWER 2 OF 65 BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN
TI Production of substances e.g. polyhydroxy alkanoic acid, comprising culturing microorganisms which accumulate substances into the microbial cells, self-autolysing the microorganisms and isolating the substance from autolysis solution;
polyhydroxyalkanoate preparation by microorganism fermentation
AN 2003-28136 BIOTECHDS
PI JP 2003219895 5 Aug 2003

L73 ANSWER 3 OF 65 WPIDS COPYRIGHT 2007 THE THOMSON CORP on STN

TI Paper sheet for paper containers used for packing foodstuffs, consists of base paper material having biodegradable resin layer on side(s)
PI JP 2003013391 A 20030115 (200366)* JA 9[0]
IN KAKEMURA T; KAMINAGA J; KATO Y; MATSUO R; YAMAWAKI K

L73 ANSWER 4 OF 65 MEDLINE on STN DUPLICATE 1
TI Production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) with high molar fractions of 3-hydroxyvalerate by a threonine-overproducing mutant of Alcaligenes sp. SH-69.
SO Biotechnology letters, (2003 May) Vol. 25, No. 9, pp. 665-70.
Journal code: 8008051. ISSN: 0141-5492.
AU Choi Gang Guk; Kim Moo Woong; Kim Jeong-Yoon; Rhee Young Ha
AN 2003350281 MEDLINE

L73 ANSWER 5 OF 65 EMBASE COPYRIGHT (c) 2007 Elsevier B.V. All rights reserved on STN DUPLICATE 2
TI Ecology and industrial microbiology microorganisms hard at work and willing to do more.
SO Current Opinion in Microbiology, (2003) Vol. 6, No. 3, pp. 203-205.
ISSN: 1369-5274 CODEN: COMIF7
AU Witholt B.; Rosenberg E.
AN 2003285228 EMBASE

L73 ANSWER 6 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN
TI Commodity chemicals production by fermentation: An overview
SO FERMENTATION BIOTECHNOLOGY, (2003) Vol. 862, pp. 3-17.
ISSN: 0097-6156.
AU Saha B C (Reprint)
AN 2004:3429 SCISEARCH

L73 ANSWER 7 OF 65 BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN
TI Polyhydroxyalkanoate-type polyester comprising 3-hydroxy-omega-(4-vinylphenyl)alkanoic acid units are prepared by using a microorganism, especially Pseudomonas;
nvolving Pseudomonas cichorii, Pseudomonas jessenii and Pseudomonas putida culture mediums
AU SUZUKI T; SUGAWA E; YANO T; NOMOTO T; IMAMURA T; HONMA T; KENMOKU T
AN 2003-09619 BIOTECHDS
PI EP 1236752 4 Sep 2002

L73 ANSWER 8 OF 65 MEDLINE on STN DUPLICATE 3
TI Construction of self-disruptive Bacillus megaterium in response to substrate exhaustion for polyhydroxybutyrate production.
SO Applied microbiology and biotechnology, (2002 Jul) Vol. 59, No. 2-3, pp.

211-6. Electronic Publication: 2002-04-12.
Journal code: 8406612. ISSN: 0175-7598.
AU Hori K; Kaneko M; Tanji Y; Xing X-H; Unno H
AN 2002365954 MEDLINE

L73 ANSWER 9 OF 65 BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN
TI Two different pathways for D-xylose metabolism and the effect of xylose concentration on the yield coefficient of L-lactate in mixed-acid fermentationby the lactic acid bacterium Lactococcus lactis 10-1;
bacterium fermentation for polyhydroxyalkanoate production and property control
SO APPLIED MICROBIOLOGY AND BIOTECHNOLOGY; (2002) 60, 1-2, 160-167 ISSN: 0175-7598
AU TANAKA K; KOMIYAMA A; SONOMOTO K; ISHIZAKI A; HALL SJ; STANBURY R
AN 2002-19787 BIOTECHDS

L73 ANSWER 10 OF 65 WPIDS COPYRIGHT 2007 THE THOMSON CORP on STN

TI Preparations for chondrogenesis containing with effect on chondrocyte proliferation, biodegradable polymer and water-soluble and water-dispersible organic solvent, useful in repair and regeneration of cartilage
PI WO 2001066142 A1 20010913 (200170)* JA 86[13]
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2001036058 A 20010917 (200204) EN
EP 1266664 A1 20021218 (200301) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
JP 2001564794 X 20030702 (200352)# JA
US 20030187054 A1 20031002 (200365) EN
IN HAYASHI Y; HAYASHI Y C S K K; KITAMURA H; KITAMURA H C S K; NAGAO S; NAGAO S C S K K

L73 ANSWER 11 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN
TI Biosynthetic controls on the 13C contents of organic components in the photoautotrophic bacterium Chloroflexus aurantiacus
SO Journal of Biological Chemistry (2001), 276(14), 10971-10976
CODEN: JBCHA3; ISSN: 0021-9258
AU Van der Meer, Marcel T. J.; Schouten, Stefan; Van Dongen, Bart E.; Rijpstra, W. Irene C.; Fuchs, Georg; Sinninghe Damste, Jaap S.; De Leeuw, Jan W.; Ward, David M.
AN 2001:394995 HCAPLUS
DN 135:134445

L73 ANSWER 12 OF 65 BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN
TI Optimization of cell growth and poly(3-hydroxybutyrate) accumulation on date syrup by a Bacillus megaterium strain;
effect of C-source and N-source on poly-beta-hydroxybutyrate production
SO Biotechnol.Lett.; (2001) 23, 14, 1119-23
CODEN: BILED3 ISSN: 0141-5492
AU Omar S; Rayes A; Eqaab A; Viss I; *Steinbuechel A
AN 2001-11248 BIOTECHDS

L73 ANSWER 13 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN
TI Development of a novel method for feeding a mixture of L-lactic acid and acetic acid in fed-batch culture of Ralstonia eutropha for poly-D-3-hydroxybutyrate production

SO JOURNAL OF BIOSCIENCE AND BIOENGINEERING, (JUN 2001) Vol. 91, No. 6, pp. 545-550.
ISSN: 1389-1723.
AU Tsuge T; Tanaka K; Ishizaki A (Reprint)
AN 2001:710122 SCISEARCH

L73 ANSWER 14 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN
TI Production of PHB by a Bacillus megaterium strain using sugarcane molasses and corn steep liquor as sole carbon and nitrogen sources
SO Microbiological Research (2001), 156(3), 201-207
CODEN: MCRSEJ; ISSN: 0944-5013
AU Gouda, Mona K.; Swellam, Azza E.; Omar, Sanaa H.
AN 2001:890101 HCAPLUS
DN 136:52763

L73 ANSWER 15 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN
TI Effect of levulinic acid on the production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) by Ralstonia eutropha KHB-8862
SO JOURNAL OF MICROBIOLOGY, (MAR 2001) Vol. 39, No. 1, pp. 79-82.
ISSN: 1225-8873.
AU Chung S H (Reprint); Choi G G; Kim H W; Rhee Y H
AN 2001:303234 SCISEARCH

L73 ANSWER 16 OF 65 MEDLINE on STN DUPLICATE 4
TI Development of a process for the biotechnological large-scale production of 4-hydroxyvalerate-containing polyesters and characterization of their physical and mechanical properties.
SO Biomacromolecules, (2001 Spring) Vol. 2, No. 1, pp. 45-57.
Journal code: 100892849. ISSN: 1525-7797.
AU Gorenflo V; Schmack G; Vogel R; Steinbuchel A
AN 2002679145 MEDLINE

L73 ANSWER 17 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN
TI Two-stage continuous process development for the production of medium-chain-length poly(3-hydroxyalkanoates)
SO BIOTECHNOLOGY AND BIOENGINEERING, (5 JAN 2001) Vol. 72, No. 1, pp. 19-24.
ISSN: 0006-3592.
AU Jung K; Hazenberg W; Prieto M; Witholt B (Reprint)
AN 2001:12574 SCISEARCH

L73 ANSWER 18 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN
TI Microbial production of polyhydroxyalkanoates by bacteria isolated from oil wastes
SO Applied Biochemistry and Biotechnology (2000), 84-86, 843-857
CODEN: ABIBDL; ISSN: 0273-2289
AU Wong, Ai Ling; Chua, Hong; Yu, Peter Hoi Fu
AN 2000:373827 HCAPLUS
DN 133:134218

L73 ANSWER 19 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 5
TI Recent developments in metabolic engineering
SO CHINESE JOURNAL OF ORGANIC CHEMISTRY, (OCT 2000) Vol. 20, No. 5, pp. 634-640.
ISSN: 0253-2786.
AU Tang G L (Reprint); Chen H B
AN 2000:794945 SCISEARCH

L73 ANSWER 20 OF 65 BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN
TI Production of optically active (R)-(-)-hydroxycarboxylic acids; production of stereospecific e.g. poly-beta-hydroxybutyrate using recombinant Pseudomonas aeruginosa and Pseudomonas oleovorans, useful

as e.g. antibiotic, vitamin, aromatic, etc.
AU Lee S Y; Wang F; Lee Y
AN 1999-11732 BIOTECHDS
PI WO 9929889 17 Jun 1999

L73 ANSWER 21 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 6
TI Effect of feed protein source on digestion and wool production in angora rabbit
SO ASIAN-AUSTRALASIAN JOURNAL OF ANIMAL SCIENCES, (NOV 1999) Vol. 12, No. 7, pp. 1075-1079.
ISSN: 1011-2367.
AU Bhatt R S (Reprint); Sawal R K; Mahajan A
AN 1999:714020 SCISEARCH

L73 ANSWER 22 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN
TI Optimization of L-lactic acid feeding for the production of poly-D-3-hydroxybutyric acid by Alcaligenes eutrophus in fed-batch culture
SO JOURNAL OF BIOSCIENCE AND BIOENGINEERING, (OCT 1999) Vol. 88, No. 4, pp. 404-409.
ISSN: 1389-1723.
AU Tsuge T; Tanaka K; Shimoda M; Ishizaki A (Reprint)
AN 1999:944912 SCISEARCH

L73 ANSWER 23 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN
TI Biotechnological production and characterization of polyesters containing 4-hydroxyvaleric acid and medium-chain-length hydroxyalkanoic acids
SO MACROMOLECULES, (10 FEB 1998) Vol. 31, No. 3, pp. 644-649.
ISSN: 0024-9297.
AU Schmack G; Gorenflo V; Steinbuchel A (Reprint)
AN 1998:151695 SCISEARCH

L73 ANSWER 24 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 7
TI Poly(3-hydroxybutyrate) production from xylose by recombinant Escherichia coli
SO BIOPROCESS ENGINEERING, (MAY 1998) Vol. 18, No. 5, pp. 397-399.
ISSN: 0178-515X.
AU Lee S Y (Reprint)
AN 1998:418847 SCISEARCH

L73 ANSWER 25 OF 65 EMBASE COPYRIGHT (c) 2007 Elsevier B.V. All rights reserved on STN DUPLICATE 8
TI Anti-HIV activity in vitro of MGN-3, an activated arabinoxylane from rice bran.
SO Biochemical and Biophysical Research Communications, (4 Feb 1998) Vol. 243, No. 1, pp. 25-29. .
Refs: 17
ISSN: 0006-291X CODEN: BBRCA
AU Ghoneum M.
AN 1998304584 EMBASE

L73 ANSWER 26 OF 65 MEDLINE on STN DUPLICATE 9
TI Biosynthesis of poly(4-hydroxybutyric acid) by recombinant strains of Escherichia coli.
SO FEMS microbiology letters, (1997 Aug 15) Vol. 153, No. 2, pp. 411-8.
Journal code: 7705721. ISSN: 0378-1097.
AU Hein S; Sohling B; Gottschalk G; Steinbuchel A
AN 97417812 MEDLINE

L73 ANSWER 27 OF 65 MEDLINE on STN
TI Patterns of phosphoantigen stimulation of human Vgamma9/Vdelta2 T cell clones include Th0 cytokines.

SO Human immunology, (1997 Dec) Vol. 58, No. 2, pp. 70-82.
Journal code: 8010936. ISSN: 0198-8859.
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SO   Annali di Chimica (Rome, Italy) (1957), 47, 722-7
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L73 ANSWER 57 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN
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SO   Acta Chemica Scandinavica (1947), 1, 54-68
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OREF 35:7369f-i,7370a-d

L73 ANSWER 60 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN
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OREF 31:5755h-i,5756a-b

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SO   Journal of the American Chemical Society (1937), 59, 679-86
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SO   JOUR INFECT DIS, (1933) Vol. 52, No. 2, pp. 242-245.
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L73  ANSWER 64 OF 65  HCAPLUS  COPYRIGHT 2007 ACS on STN
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AN   1932:25971  HCAPLUS
DN   26:25971
OREF 26:2737g-i,2738a-b

L73    ANSWER 65 OF 65   NTIS COPYRIGHT 2007 NTIS on STN
TI     Microbial conversion of agricultural and forest by-products to
       biodegradable thermoplastics, poly-B-hydroxyalkanoates (PHAs).
NR     MIC-96-02734/XAB; ISBN-0-662-22755-7
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AN     1996(18):04917   NTIS


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=> d ab 4-9,14-19

L73  ANSWER 4 OF 65    MEDLINE on STN                        DUPLICATE 1
AB   A threonine overproducing mutant of Alcaligenes sp.  SH-69 was isolated
     and its ability to produce poly(3-hydroxybutyrate-co-3-hydroxyvalerate),
     poly(3HB-co-3HV), was investigated.  The 3HV fraction in poly(3HB-co-3HV)
     produced from glucose as the sole carbon source exceeded 22 mol%, which is
     approximately six times higher than that achieved by the wild type under
     the same culture conditions.  Furthermore, the addition of a relatively
     low concentration (10 mM) of propionic acid, valeric acid or
     levulinic acid to the glucose medium greatly increased
     the molar fraction of 3HV in the copolyester, to 38-77 mol%.  The results
     suggest that metabolic engineering of the biosynthetic pathways supplying
     polyhydroxyalkanoate monomers, such as the threonine biosynthetic
     pathway, can lead to new poly(3HB-co-3HV)-producing strains.

L73  ANSWER 5 OF 65  EMBASE  COPYRIGHT (c) 2007 Elsevier B.V. All rights
     reserved on STN                                         DUPLICATE 2

L73  ANSWER 6 OF 65  SCISEARCH  COPYRIGHT (c) 2007 The Thomson Corporation  on
     STN
AB     Various commodity chemicals such as alcohols, polyols, organic acids,
     amino acids, polysaccharides, biodegradable plastic components, and
     industrial enzymes can be produced by fermentation.  This overview focuses
     on recent research progress in the production of a few chemicals: ethanol,
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1,3-propanediol, lactic acid, polyhydroxyalkanoates, exopolysaccharides and vanillin. The problems and prospects of cost-effective commodity chemical production by fermentation and future directions of research are presented.

L73 ANSWER 7 OF 65 BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN
AB DERWENT ABSTRACT:
NOVELTY - Polyhydroxyalkanoate-type polyester comprises 1 unit % or more of 3-hydroxy-omega-(4-vinylphenyl)alkanoic acid unit of specified formula..

DETAILED DESCRIPTION - Polyhydroxyalkanoate-type polyester comprises 1 unit % or more of 3-hydroxy-omega-(4-vinylphenyl)alkanoic acid unit of formula (I). n = 0-7. An INDEPENDENT CLAIM is also included for a method of producing the polyester (I) from omega-(4-vinylphenyl)alkanoic acid of formula (IV) by using a microorganism. p = 0-7.

BIOTECHNOLOGY - Preferred Method: Producing (I) further comprises recovering the polyester from the microorganism. Preferred Medium: The microorganism is cultured in a culture medium comprising: (i) the omega-(4-vinylphenyl)alkanoic acid, especially 5-(4-vinylphenyl)valeric acid; (ii) a peptide source, especially polypeptone; (iii) yeast extract; (iv) organic acid (salt), especially pyruvic acid, oxalacetic acid, citric acid, isocitric acid, ketoglutaric acid, succinic acid, fumaric acid, malic acid, and/or lactic acid; (v) an amino acid (salt), especially glutamic acid, and/or aspartic acid; (vi) a carbohydrate, especially glyceraldehyde, erythrose, arabinose, xylose, glucose, galactose, mannose, fructose, glycerol, erythritol, xylitol, gluconic acid, glucuronic acid, galacturonic acid, maltose, sucrose and/or lactose; and/or (vii) a straight-chain 4-12C alkanoic acid (salt). Preferred Microorganism: The microorganism belongs to the genus Pseudomonas, especially Pseudomonas cichorii YN2 (FERM BP-7375), P. cichorii H45 (FEM BP-7374), P. jessenii P161 (FERM BP-7376), or P. putida P91 (FERM BP-7373).

USE - The polyesters produced are used in development of new functional polymers.

ADVANTAGE - Polyesters produced have good processing properties.

EXAMPLE - M9 medium (pH 7.0) was prepared by mixing together (g/L) 6.3 Na2HPO4, 3.0 KH2PO4, 1.0 NH4Cl, and 0.5 NaCl. M9 medium comprising 5-(4-vinylphenyl)valeric acid and polypeptone as peptide source (nutrient), strain YN2 was cultured by one-step culture for PHA production. A colony of strain YN2 grown on an agar plate was inoculated in a 500 mL shaking flask containing 200 mL M9 culture medium containing 0.5% polypeptone and 0.05% 5-(4-vinylphenyl)valeric acid and cultured at 30degreesC for 48 hr. The grown cells were then collected by centrifugal separation and washed with methanol and lyophilized. The dry cell matter was weighed. Chloroform was added to the dried cells to extract the polymer at 40degreesC for 24 hr. The chloroform extract was filtered to remove cell debris and the chloroform layer in which the polymer was dissolved was concentrated by an evaporator and the residue recovered with cold methanol. The recovered precipitate was then dried under reduced pressure to obtain the objective polymer. The dry cell weight was 139 mg and the weight of the obtained (recovered) polymer was 22 mg. The obtained polymer had a Mn of 3700 and Mw of 8900. (25 pages)

L73 ANSWER 8 OF 65 MEDLINE on STN DUPLICATE 3
AB In order to establish a novel recovery system for polyhydroxyalkanoates, a self-disruptive strain of Bacillus megaterium that responds to substrate exhaustion was constructed. A gene cassette carrying the lysis system of Bacillus amyloliquefaciens phage - holin and endolysin - was inserted into the Escherichia coli- Bacillus subtilis shuttle vector pX under the control of a xylose -inducible expression system, xylR-xylA '. In this system, the expression of a target gene is induced by xylose but inhibited by glucose, which acts as an anti-inducer. B. megaterium was transformed with pX conveying the phage lysis system, which was integrated into the amyE locus

of chromosomal DNA of B. megaterium by homologous recombination. The lysis system caused self-disruption of the transformant cells effectively even when expression of the lysis genes was induced during stationary phase. For the production of polyhydroxybutyrate (PHB), the transformant was grown in a medium containing glucose as a substrate in the presence of xylose. When the glucose concentration approached zero, self-disruption was spontaneously induced, releasing intracellularly accumulated PHB into the culture broth. This system realizes timely cell disruption immediately after the PHB content in the cell reaches a maximum level.

L73 ANSWER 9 OF 65 BIOTECHDS COPYRIGHT 2007 THE THOMSON CORP. on STN

AB AUTHOR ABSTRACT - In lactic acid bacteria, pentoses are metabolized via the phosphoketolase pathway, which catalyzes the cleavage of D-xylulose-5-phosphate to equimolaramounts of glyceraldehyde 3-phosphate and acetylphosphate. Hence the yieldcoefficient of lactate from pentose does not exceed 1.0 mol/mol, while that of Lactococcus lactis IO-1(JCM7638) at high D-xylose concentrations oftenexceeds the theoretical value. This suggests that, in addition to the phosphoketolase pathway, L. lactis IO-1 may possess another metabolic pathway that produces only lactic acid from xylose. In the present study, the metabolism of xylose in L. lactis IO-1 was deduced from the product formation andenzyme activities of L. lactis IO-1 in batch culture and continuous culture. During cultivation with xylose concentrations above ca. 50 g/l, the yield coefficient Of L-lactate exceeded 1.0 mol/mol while those of acetate, formate and ethanol were very low. At xylose concentrations less than 5 g/l, acetate, formate and ethanol were produced with yield coefficients of about1.0 mol/mol, while L-lactate was scarcely produced. In cells grown at highxylose concentrations, a marked decrease in the specific activities of phosphoketolase and pyruvate formate lyase (PFL), and an increase in those of transketolase and transaldolase were ob-served. These results indicate thatin L. lactis IO-1 xylose may be catabolized by two different pathways, thephosphoketolase pathway yielding acetate, formate and ethanol, and the pentose phosphate (PP)/glycolytic pathway which converts xylose to L-lactate only. Furthermore, it was deduced that the change in the xylose concentrationin the culture medium shifts xylulose 5-phosphate metabolism between the phosphoketolase pathway and the PP/glycolytic pathway in L. lactis IO-1, andpyruvate metabolism between cleavage to acetyl-CoA and formic acid by PFLand the reduction to L-lactate by lactate dehydrogenase. (8 pages)

L73 ANSWER 14 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN

AB Poly(hydroxybutyric acid) (PHB) and other biodegradable polyesters are promising candidates for the development of environment-friendly, totally biodegradable plastics. The use of can molasses and corn steep liquor, two of the cheapest substrates available in Egypt, may help to reduce the cost of producing such biopolyesters. In this work, the effect of different carbon sources was studied. Maximum production of PHB was obtained with cane molasses and glucose as sole carbon sources (40.8, 39.9 per mg cell dry matter, resp.). The best growth was obtained with 3% molasses, while maximum yield of PHB (46.2% per mg cell dry matter) was obtained with 2% molasses. Corn steep liquor was the best nitrogen source for PHB synthesis (32.7 mg per cell dry matter), on the other hand, best growth was observed when ammonium chloride, ammonium sulfate, ammonium oxalate or ammonium phosphate were used as nitrogen sources.

L73 ANSWER 15 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN

AB The influence of levulinic acid (LA) on the production of copolyester consisting of 3-hydroxybutyrate (3HB) and 3-hydroxyvalerate (3HV) by Ralstonia eutropha was investigated. Addition of LA into the culture medium greatly increased the molar fraction of 3HV in the copolyester, indicating that LA can be utilized as a precursor of 3HV. In shake flask culture, the 3HV content in the copolyester increased

from 7 to 75 mol% by adding 0.5 to 4.0 g/L LA to the medium containing fructose syrup as a main carbon source. A maximal copolyester concentration of 3.6 g/L (69% of dry cell weight) was achieved with a 3HV content of 40 mol% in a jar fermenter culture containing 4.0 g/L of LA. When LA (total concentration, 4 g/L) was added repeatedly into a fermenter culture to maintain its concentration at a low level, the copolyester content and the 3HV yield from LA reached up to 85% of dry cell weight and 5.0 g/g, respectively, which were significantly higher than those when the same concentration of the LA was supplied all at once. The present results indicated that LA is more effective than propionate or valerate as a cosubstrate for the production of copolyesters with varying molar fractions of 3HV by R. eutropha.

L73 ANSWER 16 OF 65 MEDLINE on STN DUPLICATE 4

AB A process for the large-scale production of 4-hydroxyvalerate (4HV)-containing biopolyesters with a new monomer composition was developed by means of high-cell-density cultivation applying recombinant strains of Pseudomonas putida and Ralstonia eutropha, harboring the PHA-biosynthesis genes phaC and phaE of Thiocapsa pfennigii. Cell densities of about 20 g/L revealing a PHA content of 52% (w/w) and a molar fraction of 4HV of up to 15.4 mol % were obtained by a two-stage fed-batch cultivation process at a 25-L scale using octanoic acid during the growth phase and levulinic acid for the accumulation of 4HV-containing polyesters. Besides 4HV the polyester contained significant amounts of both 3-hydroxybutyric acid (3HB) and 3-hydroxyvaleric acid (3HV) and traces of 3-hydroxyhexanoic acid (3HHx) and 3-hydroxyoctanoic acid (3HO). With glucose or gluconic acid as the growth substrate, the components of the polyester could be reduced to mainly 3HV and 4HV with only a negligible fraction of 3HB, resulting in a polyester with a new composition. Scale-up of the cultivation process to a 500-L scale was successfully performed, resulting in the production of these polyesters at a pilot plant scale. Short-term shifts in temperature and pH resulted in the formation of cell agglomerates of about 50-100 microm by which the effectiveness of the semicontinuous centrifugation process was drastically increased. Washing of the freeze-dried cells with boiling methanol significantly shortened the extraction process and resulted in a polyester of higher purity. The physical and mechanical properties of these copolyesters were characterized by means of size exclusion chromatography, dynamic mechanical analysis, differential scanning calorimetry, stress-strain measurements, and measurements of the viscosity of the solution. The copolyesters were cast into films, spun to fibers, or processed into test bars by melt spinning and injection molding, respectively. They revealed an almost entirely amorphous structure and consequently were sticky and lacked strength. However they showed high thermal stability and an unusually high elongation at break of about 200%; the molecular weights (M(w)) were between 2.0 x 10(5) and 3.3 x 10(5) g/mol. It was shown that 4HV-containing polyesters belong to the class of thermoplastic elastomeres.

L73 ANSWER 17 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN

AB Pseudomonas oleovorans forms medium-chain-length poly(3-hydroxyalkanoate) (PHA) most effectively at growth rates below the maximum specific growth rate. Under adequate conditions, PHA accumulates rates in inclusion bodies in cells up to levels higher than half of the cell mass, which is a time-consuming process. For PHA production, a two-stage continuous cultivation system with two fermenters connected in series is a potentially useful system. It offers production of cells at a specific growth rate in a first compartment at conditions that lead cells to generate PHA at higher rates in a second compartment, with a relatively long residence time. In such a system, dilution rates of 0.21 h(-1) in the first fermentor (D-1) and 0.16 h(-1) in the second fermenter (D-2) were found to yield the highest volumetric PHA productivity. Transient-state experiments allowed

investigation of D-1 and D-2 over a wide dilution rate range at high resolution in time-saving experiments. Furthermore, the influence of temperature, pH, nutrient limitation, and carbon source on PHA productivity was investigated and results similar to optimum conditions in single-stage chemostat cultivations of P. oleovorans we re found. With all culture parameters optimized, a volumetric PHA productivity of 1.06 g L-1 h(-1) was determined. Under these conditions, P. oleovorans cells contained 63% (dry weight) PHA in the effluent of the second fermenter. This is the highest PHA productivity and PHA content reported thus far for P. oleovorans cultures grown on alkanes. (C) 2001 John Wiley & Sons, Inc.

L73 ANSWER 18 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN

AB A Gram-pos. coccus-shaped bacterium capable of synthesizing higher relative mol. weight (Mr) polyhydroxybutyrate (PHB) was isolated from sesame oil and identified as Staphylococcus epidermidis (by Microbial ID, Inc., Newark, NJ). The experiment was conducted by shake flask fermentation culture using media containing fructose. Cell growth up to a dry mass of 2.5 g/L and PHB accumulation up to 15.02% of cell dry wt was observed Apart from using single carbohydrate as a sole carbon source, various industrial food wastes including sesame oil, ice cream, malt, and soya wastes were investigated as nutrients for S. epidermidis to reduce the cost of the carbon source. It was found that by using malt wastes as nutrient for cell growth, PHB accumulation of S. epidermidis was much better than using other wastes as nutrient source. The final dried cell mass and PHB production using malt wastes were 1.76 g/L and 6.93% polymer/cells (grams/g), and 3.5 g/L and 3.31% polymer/cells (grams/g) in shake flask culture and in fermentor culture, resp. The bacterial polymer was characterized by 1H-NMR (NMR), 13C-NMR, Fourier transform IR, and differential scanning calorimetry. The results show that with different industrial food wastes as carbon and energy sources, the same biopolymer (PHB) was obtained. However, the use of sesame oil as the carbon source resulted in the accumulation of PHB with a higher m.p. than that produced from other food wastes as carbon sources by this organism under similar exptl. conditions.

L73 ANSWER 19 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 5

AB Recent developments in metabolic engineering, including the decomposition of environmental contaminants such as polyhalogenated compounds, the production of important chemicals including 2 - keto - L - gulonic acid, antibiotics, propanediol, polyhydroxyalkanoates, taxol, ct al, the utilization of recyclable lignocellulosic material such as xylose, the industrial fermentation, and the modification of high plants, even the strategies of metabolic engineering are briefly reviewed.

=> d ab 22-24,26,28,29,32,34-37,39,65

L73 ANSWER 22 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN

AB We investigated optimization of the feeding of L-lactic acid for the production of poly-D-3-hydroxybutyric acid [P(3HB)] by Alcaligenes eutrophus in a fed-batch culture system, An acidic substrate solution was fed automatically so as to maintain the pH of the culture liquid at 7.0. Feeding of a substrate solution containing 45% (w/v) L-lactic acid, 6.2% (w/v) sodium L-lactate, 5.8% (w/v) ammonia water and 1.8% (w/v) potassium phosphate [at a molar ratio of carbon to nitrogen (C/N molar ratio) of 10], allowed the L-lactate concentration in the culture liquid to be maintained at approximately 2 g/l and the cell concentration reached 27.4 g/l after 15 h of cultivation, To promote P(3HB) production, a two-stage fed-batch culture consisting of a culture for cell growth and one for P(3HB) accumulation was carried out. When the substrate solution, whose C/N molar ratio was 23, was fed during the P(3HB) accumulation phase, the

cell concentration and the P(3HB) content in the cells reached 103 g/l and 57.6% (w/w), respectively, in 51.5 h.

L73 ANSWER 23 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN

AB A two-stage aerobic fed-batch process for the biotechnological production of polyesters containing 4-hydroxyvaleric acid (4HV) and medium-chain-length hydroxyalkanoic acids by a recombinant strain of Pseudomonas putida was developed in mineral salts medium with octanoic and levulinic acid as carbon sources at a 15-L scale. The cells were first grown to high densities on octanoic acid at a pH between 7 and 8 and at a temperature of 30 degrees C. Accumulation conditions were induced in the second stage by nitrogen starvation at pH 7.0 and at 35 or 37 degrees C while levulinic acid was continuously supplied. At the end of the accumulation phase, 4HV-containing polyesters, contributing up to 50% (w/w) of the cellular dry weight, were cast into films after extraction with chloroform and precipitation with ethanol, and were spun to fibers. The unprocessed as well as the processed polyesters were characterized with respect to their molecular weight and their thermal, rheological, and mechanical properties. These polyesters showed a distinctly elastomeric behavior resulting from the low content of medium chain-length hydroxyalkanoic acids. The polyester revealed an extremely high elongation at break of approximately 1000%; the molecular weights (M-w) were between 3.3 x 10(5) and 9.4 x 10(5) g/mol and decreased during the melt spinning process.

L73 ANSWER 24 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 7

AB Several recombinant Escherichia coli strains harboring the Alcaligenes eutrophus polyhydroxyalkanoate biosynthesis genes were used to produce poly(3-hydroxybutyrate), PHB, from xylose. By flask culture of TG1 (pSYL107) in a defined medium containing 20 g/l xylose, PHB concentration of 1.7 g/l was obtained. Supplementation of a small amount of cotton seed hydrolysate or soybean hydrolysate could enhance PHB production by more than two fold. The PHB concentration, PHB content, and PHB yield on xylose obtained by supplementing soybean hydrolysate were 4.4 g/l, 73.9%, and 0.226 g PHB/g xylose, respectively.

L73 ANSWER 26 OF 65 MEDLINE on STN DUPLICATE 9

AB The aim of this study was the production of the homopolyester poly(4-hydroxybutyric acid) (poly(4HB)) with recombinant strains of Escherichia coli. Wild-type strains and other widely used non-recombinant strains of E. coli are not able to produce polyhydroxyalkanoic acids (PHA) as storage compounds and cannot utilize 4-hydroxybutyric acid as sole carbon source. Accordingly, hybrid plasmids of pBluescript vectors were constructed which harbored the Alcaligenes eutrophus PHA synthase gene (phaC) and the Clostridium kluyveri orfZ putatively encoding a 4-hydroxybutyric acid-coenzyme A transferase. A 3.5-kb genomic SmaI/ApaI fragment from A. eutrophus, which comprises phaC, and a 1.8-kb genomic ApaI/EcoRI fragment from C kluyveri, which contained orfZ, were inserted into the SmaI and EcoRI sites of the vectors pKS- and pSK-, respectively. The two resulting plasmids pSKSE5.3 and pKSSE5.3 comprising phaC and orfZ colinear or antilinear to lacZ, respectively, were transformed into E. coli XL1-Blue. Recombinant strains synthesized the homopolyester poly(4HB), when the cells were cultivated in Luria-Bertani broth and if glucose and 4-hydroxybutyric acid were provided as carbon sources. If glucose was omitted, a copolyester of 3-hydroxybutyric acid and 4-hydroxybutyric acid was accumulated. The homopolyester poly(4HB) was also accumulated during cultivation of these strains in M9 mineral salts medium containing glucose plus 4-hydroxybutyric acid as carbon sources. Poly(4HB) could amount up to approximately 80% (w/w) of the cell dry matter if E. coli XL1-Blue harboring pKSSE5.3 was cultivated in M9 mineral salts medium and if the cultures were not sufficiently supplied with oxygen. 4HB was also

incorporated into PHA if gamma-butyrolactone was used as carbon source. If levulinic acid, 4-hydroxyvaleric acid or gamma-valerolactone were used as carbon sources, only very low amounts of PHA were accumulated which did not contain 4-hydroxyalkanoic acids as constituents.

L73 ANSWER 28 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN

AB Bacterial poly(hydroxyalkanoate)s (PHA) are a complex class of polyesters, and almost one hundred different constituents are currently known. Unfortunately, most of these constituents only occur in the polyesters if specific precursor substrates are provided as a carbon source. Recently, however, bacteria and mutants were isolated which synthesize PHA from simple unrelated substrates obtainable from renewable resources provided by agriculture. This contribution provides an example of how PHA based on 4-hydroxyvaleric acid can be obtained from bulk chems. In addition, some aspects of our current knowledge on the physiol. and mol. basis of PHA biosynthesis are provided.

L73 ANSWER 29 OF 65 HCAPLUS COPYRIGHT 2007 ACS on STN

AB A review with 49 refs. Com. polyhydroxyalkanoate (PHA) production uses Alcaligenes eutrophus and glucose as a substrate for efficient polymer production (≥0.33 g/g), with a substrate cost of at least $1.68/kg PHA. This review considers the use of cheaper substrates and alternative organisms for PHA production Substrates included are high dextrose corn syrup, cane and sugar beet molasses, hemicellulose and xylose, starch, cheese whey, peptones and amino acids, vegetable oils, and CO2. Waste substrates with good potential are beet molasses with Azotobacter vinelandii, cane molasses with recombinant Klebsiella aerogenes, hemicellulose hydrolyzate with Lactococcus lactis and A. eutrophus in a two-stage process, cheese whey with recombinant Escherichia coli, oils with Pseudomonas spp., and CO2 fixation by A. eutrophus. However, impure substrates usually generate complex waste streams, which undoubtedly will increase production costs and detract from the use of many of these inexpensive substrates. Speculation about waste treatment strategies is presented and the most promising impure substrates are highlighted. Future research needs to focus on pooling expertise to upgrade raw materials, to develop novel strains, and to design processes that will efficiently use these substrates.

L73 ANSWER 32 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 11

AB Following growth of Alcaligenes sp. SH-69 on glucose as a sole carbon source for the production of poly-beta-hydroxyalkanoates (PHAs), relatively low levels of levulinic acid (LA) were detected. Experiments were carried out in batch and continuous culture, and the effects of LA addition on growth and PHA synthesis were determined. Significant stimulatory effects were observed, greater than those for propionic acid addition. In N-limited two stage continuous culture, a maximal PHA content of 38.3% (w/w) was achieved with a polyhydroxyvalerate (PHV) content of 23.5% (molar basis) at D=0.078 1/h. This resulted from, the controlled addition of LA at 0.5 g/L/h in the presence of excess glucose.

L73 ANSWER 34 OF 65 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 13

AB A two-stage culture method employing Lactococcus lactis IO-1 and Alcaligenes eutrophus was developed for the production of polyhydroxyalkanoic acid (PHA) from xylose via L-lactate. In this culture method, xylose was converted into L-lactic acid and acetic acid by a culture oft. lactis IO-1, and the organic acids were then converted into PHA by a culture of A. eutrophus. Alcaligenes eutrophus grew at a specific growth rate of 0.61/h; however, the growth rate decreased as the lactate concentration in the medium increased. When the supernatant of the IO-1 culture broth containing 10-g/L L-lactate was used as a medium for A, eutrophus in batch

culture, the cell concentration increased to 8.5 g/L in 24 h and 55% (w/w) of the content of the cells was found to be poly(beta-hydroxybutyric acid), P(3HB). Furthermore, fed-batch culture of A, eutrophus was carried out with feeding of L-lactic acid to maintain the L-lactate concentration around 3.0 g/L. As a result, 41.0 g/L of cells and 28.7 g/L of P(3HB) were produced after 17 h of cultivation.

L73 ANSWER 35 OF 65 HCAPLUS

AB Hydrogenophaga pseudoflava (formerly Pseudomonas pseudoflava) was able to accumulate a large amount of copolyesters when grown on mixed substrates of glucose and lactones in a batch fermentation Lactones such as γ-butyrolactone, γ-valerolactone, and higher analogs generally did not support cell growth when used as the sole carbon source. Co-feeding of lactones with glucose enhanced the utilization of lactones for both copolyester accumulation and cell growth. The copolyester from the cells grown on the mixed substrates of glucose (10 g/L) and γ-valerolactone (91-3 mL/L) was poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (P(3HB-co-3HV)), while cells grown with γ-butyrolactone (1-3 mL/L) as a cosubstrate produced poly(3-hydroxybutyrate-co-4-hydroxybutyrate) (P(3HB-co-4HB)). The values of parameter D, calculated from the NMR dyad-sequence data for polymer samples obtained after 72 h of cultivation, showed lactone concentration dependences differing among lactones. The time-course data obtained from growth on the cosubstrates of γ-valerolactone (2 mL/L) and glucose (10 g/L) revealed that 3HV-rich copolymers were synthesized in the early growth phase, and the 3HB-rich fraction steadily increased in the later accumulation phase and then peaked at 80 h when γ-valerolactone was depleted. These polyhydroxyalkanoate accumulation profiles suggested a high D value of the final product, whose value was determined to be 3.25. γ-Valerolactone was consumed faster than γ-butyrolactone. The difference between the assimilation behavior of the two lactones was discussed in relation to the heterogeneity of the final copolyester products. A correlation between NMR microstructure and the physiol. of polyhydroxyalkanoate accumulation was observed

L73 ANSWER 36 OF 65 BIOTECHDS

AB Developments in the field of bacterial polyhydroxyalkanoate (PHA) research were discussed. Poly-beta-hydroxybutyrate (PHB) was the first PHA described as a bacterial product, and is a thermoplastic with properties like polypropylene. PHB copolymers with beta-hydroxyvalerate may be formed by cosubstrate feeding, and have improved mechanical properties, making them suitable replacements for petrochemically produced bulk plastics. The growing marker for biodegradable polymers demands the efficient large-scale production of PHA. Alcaligenes eutrophus on a glucose feedstock has been used for PHB copolymer formation on a commercial scale. New strains which utilize lactic acid in whey, xylose from the forest industry or raw sugar and beet molasses have been developed. Metabolic engineering has been carried out in Escherichia coli for PHB production, and production of PHAs in transgenic plant systems shows great promise. (18 ref)

L73 ANSWER 37 OF 65 WPIDS

AB JP 06022773 A UPAB: 20050507

In a new preparation of polyesters, a microorganism having an ability of producing poly(3-hydroxybutyrate) is cultured on a medium containing levulinic acid and/or its salt with phosphorus and nitrogen restricted; resultant cells are collected; and polyester copolymers having repeated structural units of formulae -OCH(C2H5)CH2CO- (I), -OCH(C5H11)CH2CO- (II) and -OCH(C7H15)CH2CO- (III) are recovered.

USE/ADVANTAGE - The method gives efficiently and inexpensively biodegradable and thermoplastic copolymers having better physical properties than those of P(3HB) and being useful as a biocompatible material for suturing thread, bone-fixing materials and drug delivery systems. - In an example, the microorganism is typically Separation Nuber MHF-3

strain, Biko-ken, donation Number 12972. The microorganism is a linear, moving bacillus without sporing when cultured on a agar flat medium at 30 deg.C. for two days. The Gram-negative microorganism forms an opaque smooth colony on a Luria agar flat medium and grows well in Luria liquid medium. It is negative for nitrate reduction, esculin hydrolysis, indole formation, urea hydrolysis, V-P test, H2S formation, beta-galactosidase activity, urease activity and phenylpyruvic acid formation, positive for lysine decarboxylase, arginine dehydrase and ornithine decarboxylase activities, malonic and citric acid utilisation and polyhydroxyalkanoate productivity and aerobic.

L73 ANSWER 39 OF 65 LIFESCI DUPLICATE 14

AB The potential of Pseudomonas pseudoflava to produce poly- beta -hydroxyalkanoates (PHAs) from pentoses was studied. This organism was able to use a hydrolysate from the hemicellulosic fraction of poplar wood as a carbon and energy source for its growth. When P. pseduoflava was grown on the major sugars present in hemicelluloses in batch cultures, poly- beta -hydroxybutyric acid (PHB) accumulated when glucose, xylose, or arabinose was the sole carbon source, with the final PHB content varying from 17% (wt/wt) of the biomass dry weight on arabinose to 22% (wt/wt) of the biomass dry weight on glucose and xylose. Copolymers of beta -hydroxybutyric and beta -hydroxyvaleric acids were produced when propionic acid was added to shake flasks containing 10 g of glucose liter super(-1). The beta -hydroxyvaleric acid monomer content attained a maximum of 45 mol% when the initial propionic acid concentration was 2 g/liter.

L73 ANSWER 65 OF 65 NTIS

AB Poly-beta-hydroxylalkanoates (PHAs) are a family of beta-hydroxy carboxylic acid polyesters which are of interest for their biodegradability. PHAs can be produced more cheaply by biological process than by chemical synthesis, and the resulting polymer is optically active and degrades rapidly in the appropriate environment (such as soil burial and compost heaps). Commercialization of PHA is limited by its high production cost, mainly due to the cost of the substrate and the separation process. This report describes research on bacterial conversion of cheese whey (an abundant and cheap waste from the food industry) and hemicellulose (from low-cost forest and agricultural wastes) to substrates for high-protein biomass and PHA production. The research included investigation of the use of continuous culture of Alcaligenes eutrophus to produce PHA and an economic evaluation of the cost of PHA production from various substrates at different production scales.

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=> log y
COST IN U.S. DOLLARS                            SINCE FILE      TOTAL
                                                     ENTRY    SESSION
FULL ESTIMATED COST                                 261.51     261.72

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)      SINCE FILE      TOTAL
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